COMPARISON OF MICROSTRUCTURES AND MECHANICAL PROPERTIES
OF CONVENTIONALLY CAST AND TWIN-ROLL CAST AZ31 MAGNESIUM ALLOYS

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Abstract

Due to its attractive properties, such as low density, high specific strength, high dimensional stability, and its recyclability, magnesium alloys are widely used in various structural applications. The results of microstructure and mechanical properties investigation of AZ31 (Mg-3.3Al-0.9Zn) magnesium alloy and the comparison of the annealing response based on two conditions produced by different casting techniques was done in the present study. The original ingot of the master AZ31 alloy, and a strip, cast from the ingot by twin-roll casting (TRC), reveals different stability upon the heat treatment and tensile testing. The properties evolution of the studied alloys followed by annealing is monitored by the light microscopy, microhardness testing and measuring of electrical resistivity. The results indicate that the heat treatment can change the amount, size, morphology and distribution of secondary phases, and thus can modify the mechanical properties. It was also established that microstructure changes are more pronounce in the TRC material than in the standard one.

Keywords: magnesium, AZ31, twin roll casting, magnesium strip

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